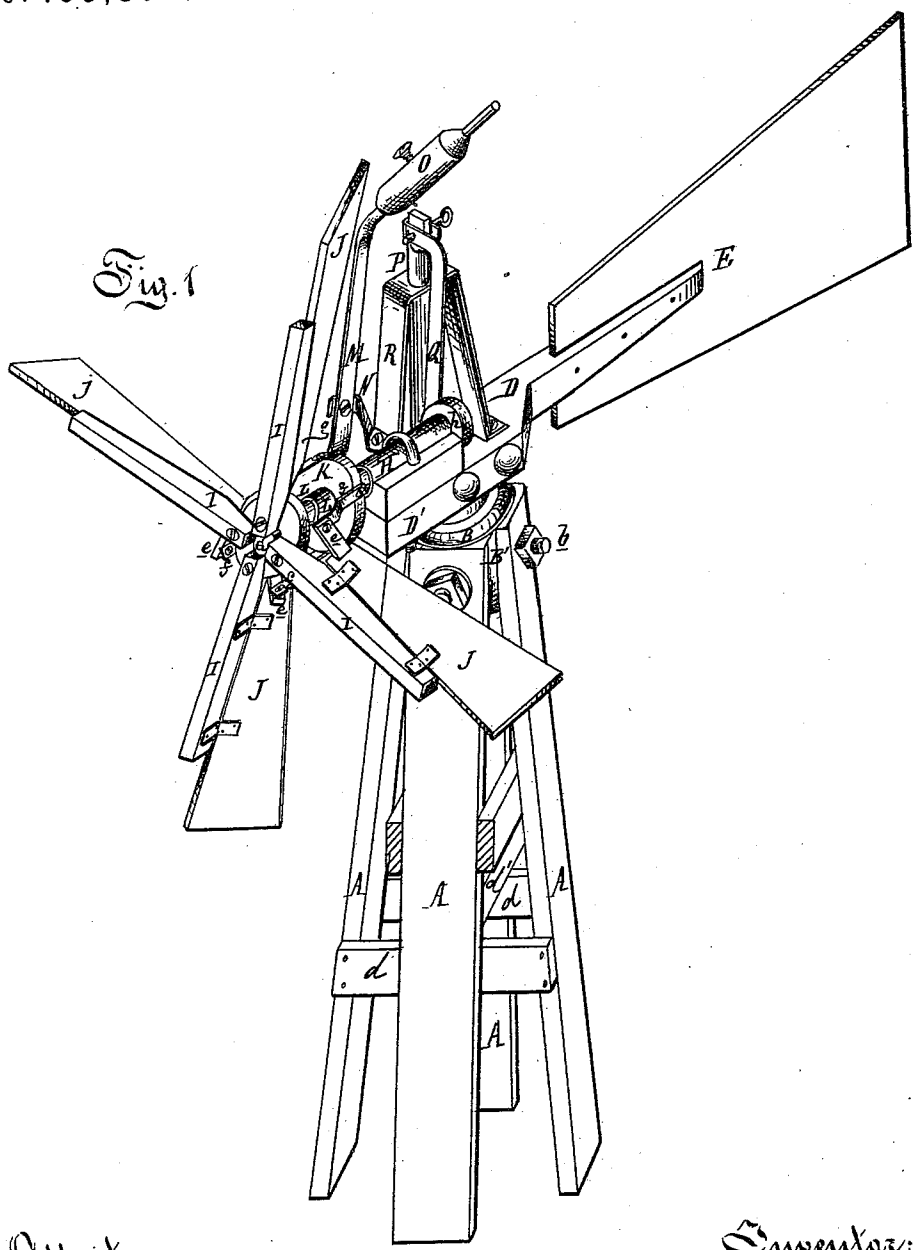
2 Sheets--Sheet 1.

R. N. ROCKWELL.

Wind-Mill.

No. 165,873. Patented July 20, 1875.

Fig. 1



Attest:
Edward Barthel.
Wm. P. Spalding

Inventor:
R. N. Rockwell
By Atty
Wm. S. Sprague

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

2 Sheets--Sheet 2.

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Fig. 2.

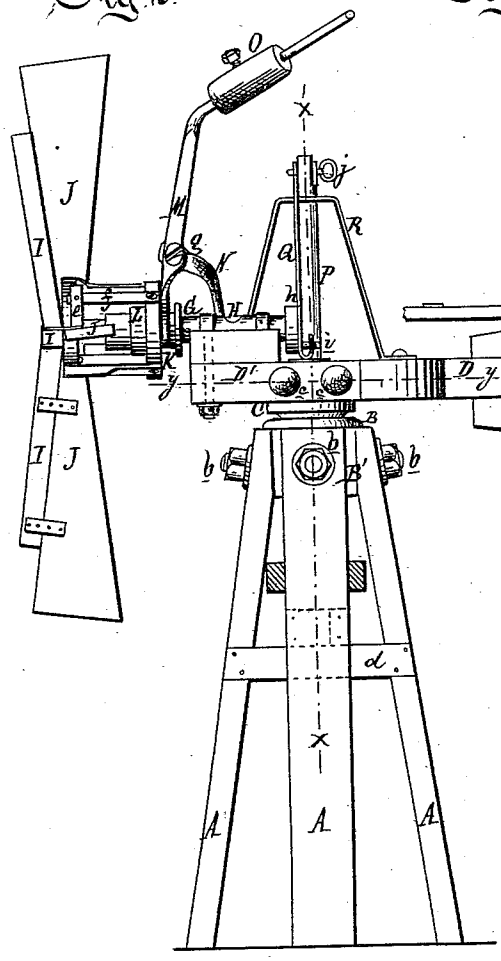


Fig. 3.

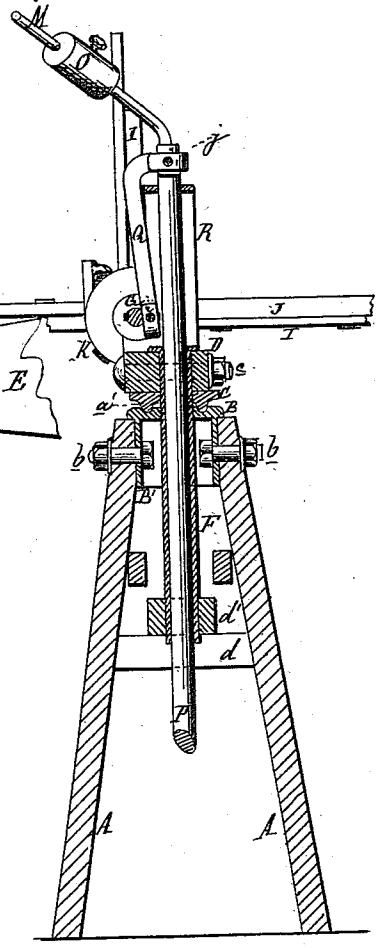


Fig. 4.

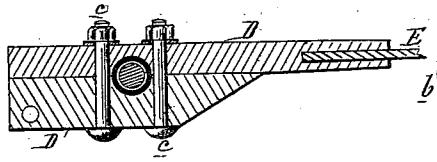
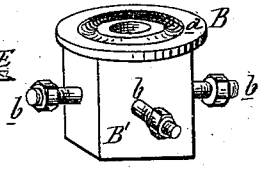


Fig. 5.



Attest:
Edward Barthel.
Wm. P. Spalding

Inventor:
R. N. Rockwell
By Atty
Thos. S. Sprague

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ROBERT N. ROCKWELL, OF GLENWOOD, IOWA.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **165,873**, dated July 20, 1875; application filed February 12, 1875.

To all whom it may concern:

Be it known that I, ROBERT N. ROCKWELL, of Glenwood, in the county of Mills and State of Iowa, have invented an Improvement in Windmills, of which the following is a specification:

The nature of this invention relates to an improvement in windmills of that class which has its sails so arranged as to be turned out of the wind by the pressure thereof when a certain limit of pressure has been exceeded; and it consists in the peculiar combination of devices for governing the position or angle of the sails with relation to the arms to which they are hinged; in the peculiar construction of the turn-table bearing, and manner of securing the same to the tower; in the peculiar manner of securing the tubular plunger-rod guide to the turn-table, as more fully hereinafter set forth.

Figure 1, Sheet 1, is a perspective view of my windmill. Fig. 2, Sheet 2, is a partial side elevation, showing the sails turned nearly out of the wind. Fig. 3 is a vertical section at *x x*. Fig. 4 is a horizontal section at *y y*. Fig. 5 is a detached perspective view of the casting which forms the bearing for the turn table.

In the drawing, A A represent four timber-struts, forming a pyramidal tower-like structure, the upper part of each being secured, by a bolt, *b*, to one of the four pendent faces of a flange, B′, of a circular casting, B, which rests on their tops, and which forms a bearing for the turn-table D, to the under side of which is secured a circular wear-plate, C, which is provided with an annular bead, *a′*, which is received in an annular groove, *a*, formed in the upper surface of the casting B. The bead prevents any lateral displacement of the turn-table, while it also serves as a pivot for the bearing. The turn-table is made in two parts, the long one, D, carrying the vane E, and a shorter one, D′, bolted to the side of the forward end. F is a wrought-iron guide-tube, halved into the parts D D′ of the turn-table, from which it is suspended by a flange turned at its upper end, and is clamped in position by the parts D D′ through the bolts *c c*, one of which passes transversely through said parts at each side of the guide-tube, which passes through the opening in the bearing-plates below, and also between the braces *d d*, which bind the tower-struts together. The lower end of the guide-tube is held in position by passing into an opening in the middle of a brace, *d′*, extending across the frame-work. G is the shaft, journaled in a long elevated bearing, H, secured to the turn-table at one side of the central line, and to a flange on its outer end four arms, I, are bolted. To each arm is hinged a sail, J, to the inner end of whose face an arm, *e*, is affixed, to project at a right angle therefrom. To the arm is pivoted a rod, *f*, extending back, and is pivoted to a disk, K, secured to a sleeve, L, sliding on the shaft, and caused to rotate therewith by a stud on the latter projecting through a longitudinal slot in the sleeve; or, if preferred, the sleeve may be feathered on the shaft. M is a bent lever, pivoted at *g* to an inclined standard, N, on the turn-table. Its lower and shorter arm is forked to embrace a groove in the rear end of the sleeve, while its longer arm carries a sliding or adjustable weight, O, which is set in such a position as to keep the sleeve pushed forward, and through it to maintain the sails at the normal angle of about forty-five degrees with the arms, unless the pressure of the wind be increased to such an extent as to endanger the apparatus, when the sail would yield to the pressure, turning partially out of the wind, raising the weighted arm of the lever at the same time. As the pressure of the wind decreases, the weighted arm drops and brings back the sails into the wind again, acting in this respect as a governor or automatic regulator. The rear end of the shaft has a disk, *h*, secured to it, which carries a wrist-pin, *i*, which reciprocates a pump-plunger rod, P, through a connecting-rod, Q, which is pivoted, by a pin, *j*, to the top of the latter. The plunger-rod extends up some distance above the guide-tube, passing through a bearing in the top of a guide-frame, R, bolted to the top side of the turn-table. The connecting-rod is peculiarly constructed, being made of flat bar-iron, bent upon itself at each end, and curved at the upper part to reach over and connect with the plunger-rod, which it embraces and prevents from rotating axially, while its ends, being doubled upon themselves, give a broad bearing for the

wrist and pivot pins. The wind-wheel being constructed to run with the sun, the connecting-rod, when lifting the plunger-rod, lies close to and nearly parallel with the latter while raising it.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The lever M, pivoted to the standard N, and provided with the adjustable weight O, the sleeve L on the shaft G, the disk, bars *f*, and arms *e*, in combination with the sails J, hinged to the shaft-arms I, for governing the positions or angles of said sails, substantially as described.

2. The annular-grooved bearing B, provided with the quadrangular pendent flange B′, to each face of which the top of a tower-strut, A, is secured by a bolt, *b*, substantially as described.

3. The wear-plate C, provided with the annular bead *a*′, in combination with the bearing B, having an annular groove, *a*, substantially as described.

4. The guide-tube F, secured to the turn-table by clamping it between its parts D and D′, substantially as described.

ROBERT N. ROCKWELL.

Witnesses:

WM. P. HEAD,

JOHN MOORE.